REMARKS

This Amendment after FINAL rejection is filed in response to the Final Office Action mailed on 3 December 2002. All objections and rejections are respectfully traversed.

Claims 1-3, 9, 11, 12, 15-18, 20, 21, 23, 26, 27, 29-32, and 44-96 are pending.

Claims 1, 11, 17, 26, 44, 45, 70, 71, 85, and 90 were amended.

At paragraph 1 of the Office Action claims 23, 32, 44, and 73 were rejected under 35 U.S.C. 112, first paragraph on the grounds that even distribution of the packets by the hash function to the processors is not described in the specification in such a way as to enable one skilled in the art to make and/or use the invention.

Applicant respectfully traverses this rejection on the grounds previously set forth. The previous grounds are that packets arrive at the router with many different addresses, and the different addresses are hashed, and that the addresses appear substantially random to the router. Hashing packets with randomly arriving addresses leads to a random distribution of the packets to the processing engines, and hence a substantially even distribution of packets to the various processing engines.

However, in the interest of having the present Application for United States Patent allowed, Applicant has cancelled some of the claims without prejudice and has amended one of the claims.

Claims 23, 32, and 73 were cancelled without prejudice. Claim 44 was amended to better claim the invention.

At paragraph 2 of the Office Action claims 86, 87, 88, 91, 92, and 93 were rejected under 35 U.S.C. 112 second paragraph as being incomplete for omitting the step: "the routing processing."

Applicant respectfully points out that independent claim 85 for a router, and independent claim 90 for a method of processing packets in a router, at their respective last clause, claim:

"***said selected processing engine providing said type of service***."

Further, Applicant respectfully points out that the specification at page 18, lines 4-8 discloses:

> "Yet other alternative embodiments include adding specialized processing engines connected to the Xbar. Packets can be sent through these specialized engines either before or after or instead of an RPE to perform services such as compression/decompression, encryption, or routing. The classifica-

tion engine on a DC could determine the type of service required by a packet and route it appropriately."

The type of service is spelled out, as disclosed in the specification at page 18 lines 4-8, and the type of service is claimed in claims 86, 87, 88 dependent from independent claim 85, and claims 91, 92, and 93 dependent from independent claim 90:

claims 86, 91 compression;

claims 87, 92 decompression; and

claims 88, 93 encryption.

The ***said selected processing engine providing said type of service*** set out in the independent claims indicates that the "processing engine" is to be programmed to provide the service, and further, it is well known in the art how to program a processing engine to provide the service.

Accordingly, Applicant respectfully urges that the dependent claims 86, 87, 88, 91, 92, and 93 conform to all applicable requirements of law.

At paragraphs 3 and 4 of the Office Action various claims were rejected under 35 U.S.C. 102(e) under Imai et al. U.S. Patent No. 6,175,874 issued January 16, 2001.

Representative claim 1 is as follows:

1. A router for distributing packets in a network, wherein the packets originate at a source and are routed to a destination, comprising:

a plurality of route processing engines located within said router;

a mechanism that performs a hashing function on a destination address portion of network layer information in the packets transferred to the routing system, to produce an indicia of a flow and,

means for switching packets with a same said indicia of a flow to a single route processing engine of said plurality of route processing engines.

Imai discloses a Relay Device to which all packets are sent by users' terminals on an external network. The relay device then performs a hash function on source addresses of the packets, and in response to the result of the hash, directs the packets to different processing nodes.

Applicant respectfully urges that Imai has no disclosure of applicants claimed ***performs a hashing function on a destination address portion of network layer information***. That is, Applicant claims hashing a destination address in order to generate a hash result, and directs the packet to a route processing engine based on the hash of the destination address.

Further, Applicant respectfully urges that Imai disclosure teaches away from the present invention, as all of the packets received by the Imai device have the same destination address, while in sharp contrast, the packets arriving at the claimed router have different destination addresses, and so a hash function of the destination address of the packet can be used to direct the packet to a processing engine.

Even further, Applicant respectfully points out that Applicant's claimed invention would be impossible under the Imai disclosure because all of the packets received by Imai's "Relay Device 1" have the same destination address, and Applicant claims hashing the destination address to obtain different values of the hash function. Imai would obtain the same value of his hash function for every packet if he hashed the destination address of his received packets, and so could not distribute his packets in response to a constant hash result.

Accordingly, Applicant respectfully urges that Imai is legally incapable of anticipating the presently claimed invention under 35 U.S.C. 102(e) because of the absence in Imai of any disclosure of Applicant's claimed novel

a mechanism that performs a hashing function on a destination address portion of network layer information in the packets transferred to the routing system, to produce an indicia of a flow and,

means for switching packets with a same said indicia of a flow to a single route processing engine of said plurality of route processing engines.

At paragraph 5 of the Office Action claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Imai.

Applicant respectfully points out that claim 9 is dependent on independent claim 1, and claim 1 is believed to be in condition for allowance. Accordingly, claim 9 is believed to be in condition for allowance.

At paragraph 6 of the Office Action claims 3 and 12 were rejected under 35 U.S.C. 103(X) as being unpatentable over Imai in view of Varghese, et al. U. S. Patent 5,905,723 issued My 19, 1999. Applicant respectfully points out that both claim 3 and claim 12 are dependent claims, and it is believed that their respective independent claims are in condition for allowance, and so therefore it is believed that claims 3 and 12 are in condition for allowance.

At paragraph 7 of the Office Action claims 52, 53, 61-66, 76, and 80-84 were allowed.

At paragraph 8 of the Office Action the Examiner presents counter arguments to Applicant's positions taken in previous Amendments. Applicant respectfully traverses the Examiner's positions concerning Applicant's arguments.

The Examiner notes that Applicant did not respond to a 112 second paragraph rejection, presumably of claims 86, 87, 88, 91, 92, and 93, in a previous Office Action. Applicant apologizes in the event that a specific rejection was inadvertently overlooked. Applicant respectfully notes that all rejections were respectfully traversed in the Amendment filed on 19 September 2002. Reasons for this traversal are fully set out hereinabove in the present Amendment.

As for claims 23, 32, 44, and 73 the Examiner maintains that a hash function done on the addresses of packets having random destination addresses does not adequately disclose "evenly" distributing the packets to processing engines as claimed. Applicant respectfully disagrees with the Examiner's position.

However, in the interest of moving the present Application for U.S. Patent along to better place it in condition for allowance, Applicant has cancelled claims 23, 32, and 73 without prejudice, and has amended claim 44.

Further, the Examiner maintains a position that having a plurality of processing engines in a router is equivalent to having a cluster of nodes connected by computer network. Applicant respectfully disagrees.

However, in the interest of moving the present Application for U.S. Patent along to better place it in condition for allowance, Applicant has amended the rejected independent claims to include the recitation of performing a hash function on a "destination address" of a received packet in order to route the packet, an operation which would be impossible under the cited Imai patent. This claimed operation is impossible under the cited Imai patent because all of the packets which arrive at Imai's apparatus have the same destination address.

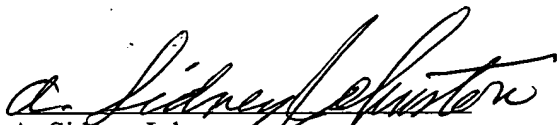
All independent claims are believed to be in condition for allowance.

All Dependent claims are believed to be dependent from allowable independent claims, and therefore in condition for allowance.

Favorable action is respectfully solicited.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,



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MARK-UP PAGES FOR THE FEBRUARY 3, 2003, AMENDMENT TO U.S. PATENT APPLICATION SER. NO. 09/053,237

The replacement for the FIRST full paragraph of page PAGE resulted from the following changes:

COPY PARAGRAPH TO BE AMENDED HERE.

The replacement for claim CLAIM resulted from the following changes:

COPY CLAIM TO BE AMENDED HERE.

1. (Six Times Amended) A router for distributing packets in a network, wherein the packets originate at a source and are routed to a destination, comprising:

a plurality of route processing engines located within said router;

a mechanism that performs a hashing function on [at least] a destination address portion of a network layer [information] in the packets transferred to the routing system, to produce an indicia of a flow and,

means for switching packets with a same said indicia of a flow to a single route processing engine of said plurality of route processing engines.

11. (Five Times Amended) A router for distributing packets in a network, wherein the packets originate at a source and are routed to a destination, comprising:

a plurality of network interfaces that transfer the packets to said [a] destination and from said [a] source;

a plurality of route processing engines located within said router;

a fabric interconnecting said plurality of network interfaces and said plurality of route processing engines;

a hashing function to hash a destination address of a packet to determine a distribution of the packets [,] by said fabric, in response to an output of said hashing function, among said plurality of route processing engines.

17. (Thrice Amended) A method, in a router, for selecting one processing engine of a plurality of processing engines located within the router for processing at least one packet, the method comprising the steps of:

hashing [at least] a destination address portion of a network layer [information] of at least one packet to determine a hash result, said hash result indicating a flow;

selecting one processing engine of said plurality of processing engines located within said router to process the flow indicated by said hash result.

26. (Thrice Amended) A system, in a router, for selecting one processing engine of a plurality of processing engines located within said router for processing at least one packet, the system comprising:

means for [examining at least a portion of] hashing a destination address of a network layer [flow information] of the at least one packet to obtain a hash result; and

means, responsive to said [at least a portion of network layer flow information] hash result, for selecting [the] one processing engine of said plurality of processing engines lo-

cated within said router to preserve a packet flow indicated by said destination address [the at least a portion of network layer flow information].

44. (Twice Amended) A routing system for distributing packets in a network, wherein the packets originate at a source and are routed to a destination, both source and destination external with respect to the routing system, comprising:

a plurality of network interfaces that transfer packets to said destination and from said source;

a plurality of route processing engines;

a hash mechanism that performs a hashing function on [at least] a destination address portion of a network layer [information] of a particular packet, in the packets transferred to the routing system, to determine a [an approximately even] distribution of the packets to the route processing engines for processing by the engines, and said hash mechanism producing a hash result giving an indication of a flow of said particular packet so that packets of a flow are switched to the same route processing engine of said plurality of route processing engines.

45. (Twice Amended) A router, comprising:

a plurality of processing engines located within said router for processing packets;

an interface for receiving a received packet from a network;

a data compiler to perform a hash function on a destination address of said received packet to generate a hash result, and to select a selected processing engine from said plurality of processing engines located within said router in response to said hash result; and,

a switch to distribute said packet to said selected processing engine.

70. (Amended) A router, comprising:

a plurality of processing engines located within said router for processing packets;

an interface for receiving a received packet from a network;

means for performing a hash function calculation on a destination address of said received packet to produce a hash result; and,

means, responsive to said hash result, for switching said received packet to a processing engine selected from said plurality of processing engines located within said router for further processing of said received packet.

71. (Amended) A method of processing packets in a router, comprising:

receiving a packet from a network;

performing a hash function calculation on a destination address of said packet to produce a hash result; and,

switching, in response to said hash result, said packet to a processing engine of a plurality of processing engines in said router, for further processing of said packet.

85. (Amended) A router, comprising:

a plurality of processing engines located within said router for processing packets;

an interface for receiving a [received] packet from a network, said packet referred to as a received packet;

a hashing function to perform a hash calculation on a destination address of said received packet, said hash calculation producing a hash result;

a data compiler to determine a type of service required by said [a] received packet; and,

a switch, responsive to said type of service and responsive to said hash result, to distribute said packet to a selected processing engine of said plurality of processing engines located within said router, said selected processing engine providing said type of service.

90. A method of processing packets in a router, comprising:

receiving a packet from a network, referred to as a received packet;

hashing a destination address of said received packet to obtain a hash result;

determining a [the] type of service required by said [a] received packet; and,

distributing, in response to said type of service and in response to said hash result, said received packet to a selected processing engine located within said router, said selected processing engine providing said type of service.